

MANPOWER RESEARCH MONOGRAPH NO. 20

Toward the Ideal Journeyman

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Volume 4. THE TRAINING SYSTEM IN THE PRINTING TRADES

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Volume 4. THE TRAINING SYSTEM IN THE PRINTING TRADES

1971

U.S. DEPARTMENT OF LABOR J.D. Hodgson, Secretary

Manpower Administration

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PREFACE

This is the fourth volume of a monograph based on a study of apprenticeship. It examines the training of printing compositors. In order to identify the elements that comprise an optimum training system, the study's researchers made an extensive examination of America's system of apprenticeship training, appraising its strengths and weaknesses. The overall study, completed in 1969, was conducted under a contract with the Office of Research and Development of the Department of Labor's Manpower Administration by Prof. Alfred S. Drew of Purdue University's School of Technology and researchers in other disciplines. The Manpower Administration's Bureau of Apprenticeship and Training, as well as advisers from labor and industry, gave invaluable guidance and information to those who prepared this study and who wrote this report.

The first volume of this monograph dealt with the "optimum" model for apprenticeable training. The second concentrated on the pipe trades and the third on the machine and tool and die trades. In this fourth volume, the emphasis is on identifying the problems of training in one part of the printing trades and on finding the special solutions to them. This volume again points out the common requisites of an adequate training program in any apprenticeable trade.

The introduction of motor-driven presses, keyboard typesetting machines, and the like have had impact not only on the printing crafts but also on society as a whole. A study of the printing trades seems particularly appropriate when one looks to the future and considers the advent of faster and better means of setting type,

improved offset operations, and computer-controlled printing processes. Advances will require corresponding changes in job skills. As shown in the following pages, both labor and industry are attempting to keep up with the new technology.

STATING

The printing industry is undergoing a rapid transformation. The traditional methods of printing are being replaced by new technologies. This is a time of great change and opportunity. The industry must adapt to these changes in order to remain competitive. The following pages discuss the challenges and opportunities facing the printing industry today.

The printing industry is a vital part of our society. It provides us with the information we need to live and work. As technology advances, the industry must evolve. This is a time of great change and opportunity. The industry must adapt to these changes in order to remain competitive. The following pages discuss the challenges and opportunities facing the printing industry today.

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INTRODUCTION

Printers (compositors), who form a basic trade group in the printing industry, were chosen to represent the printing trades for the overall apprenticeship study. In an age of communication, the compositor's task is vital; he fashions type forms and positions them before they are used on the press or before they are transferred to a "mat" if a cylindrical press is being used. The makeready character of their work gives these tradesmen the name by which they are known in the commercial printing field—"printer-preparatory."

The researchers sought their data on compositors from all sources connected with the printing trades. Rating forms and questionnaires completed by over 700 persons form the foundation of the study. Queried at one point or another from 1966 to 1968 were journeyman and apprentice compositors, employers (metropolitan newspapers and commercial printing plants), local union presidents, instructors, heads of teaching institutions or agencies offering printing courses, State and Federal training agency officials, and manufacturers of printing equipment and supplies.

Training standards developed by unions, management, and Government were studied. Joint apprenticeship committees (JAC's) administering successful programs were quizzed and onsite inspections of training were made. Finally, the researchers consulted an advisory committee composed of senior training officials of the International Typographical Union (ITU) and of employers. The advisory committee provided access to the industry as well as expert guidance and comment.

About one-third of the apprentices queried were in programs registered with the Bureau of Apprenticeship and Training or a recognized State agency. Because some 90 percent of their agreements also involved a joint employer-union apprenticeship committee, this study represents primarily the organized portion of the industry.

Although there appears to be a trend toward a shorter, 4-year apprenticeship, most of the apprentices surveyed were in 6-year programs. Shorter apprenticeship was a common suggestion of apprentices who were asked how their programs could be improved; the ITU convention recently asked locals to set apprenticeship at a maximum of 4 years—the time in which the ITU requires apprentices to complete its “Lessons in Printing.”

The researchers focused first on what makes a good journeyman. All categories of respondents gave the characteristics of high-quality work, overall skill, initiative, and ingenuity the most emphasis. Given less stress were leadership, special skills, and teaching ability—although newspaper publishers wanted a journeyman to have the potential to become a group leader, foreman, or even higher level manager.

Based on the responses ranking the characteristics, the investigators concluded that an apprenticeship training program should turn out generalists—journeymen who can handle a variety of tasks with a range of equipment—rather than specialists. Employers gave more weight to initiative than did Government personnel, who perceived overall skill as most important.

The next phase of the research was to find out what kind of training workers actually had and what is needed to produce the “ideal journeyman.” The details, reported in the following pages, point in the same general direction as do the results of the pipe tradesmen’s study and the study of the machinists and tool and die makers. These conclusions are as follows:

1. That traditional apprenticeship by itself is not enough; continuation training for journeymen is essential.
2. That although there are some means of keeping the training programs abreast of current developments, a systematic means of keeping the industry informed of new technology is badly needed.
3. That apprenticeship, while one of the oldest systems of training, is capable of adapting to new demands and that recent apprentices are more likely to be older, married, and better educated than were those of a generation ago.

ON-THE-JOB TRAINING

On-the-job training is intended to acquaint apprentices with actual work processes, to instill pride in craftsmanship, and to foster the qualities of initiative and ingenuity in actual job situations. To be successful, a system of on-the-job training must provide work experience with up-to-date machinery and equipment, offer a range of training in various processes, and be geared not simply to production schedules but also to the needs of the trainees. Ideally, progressively greater challenges to the apprentice are offered at each level of work experience. While apprentices are on the job, journeymen are the prime source of trade instruction, and a beneficial OJT experience presupposes a good relationship with these ad hoc instructors.

Apprentices and journeymen agreed that, apart from pay and the general chance to learn work processes on a paying job, the most attractive feature of on-the-job training is the quality of the instruction. They rated this higher than they did the adequacy of the equipment and the general, overall quality of their training programs. The biggest drawback to trade training, apprentices felt, was their job assignments. Many stated that they were not given enough challenging tasks or that they were not rotated from job to job often enough. Lesser numbers indicated that journeymen, while willing, did not have the time to help.

About half of the apprentices said they were deliberately rotated at least once a quarter from one type of work to another for overall exposure to the trade. But an almost equal number felt they were hardly ever or never deliberately rotated.

At least 1 apprentice in 3 reported that he needs help as often as once a week. Most of these apprentices are assigned an instructor, usually a journeyman teaching in addition to his regular work, although foremen assist 1 apprentice in 5 and a few apprentices are helped by a journeyman who is a full-time instructor. The instructor generally has fewer than three apprentices to assist, particularly if he has other duties.

When questioned about their most recent instructors, apprentices indicated that the instructors were "good" to "excellent" in trade competence. Seven out of 10 apprentices said that the instructors explained things well.

About 1 apprentice in 3 was not regularly assigned to work with a journeyman. This unassigned apprentice, while he probably has been in the trade for a while, sometimes needs help. When he does, he either watches others, asks his foreman or a journeyman with whom he has previously worked, or refers to a manual.

Reference materials were available to two-thirds of the apprentices. Such materials were understood and accepted.

Over one-half of the apprentices reported that formal records were being kept on their work by JAC's, employers, unions, or others. The correlation between the time established by the outline of training for learning various skills and the actual time spent in learning various work processes seemed fairly close to about half of the apprentices; however, 1 in 5 indicated that there was a great deal of discrepancy.

In order to add additional depth to the study, journeymen were asked to rate the apprenticeships they had served. On the whole, they rated the quality of on-the-job training higher than their related instruction. (See table 1.) Journeymen indicated that the most valuable work processes taught on the job were those which relate to the machinery—such as linotype—and such operations as composition and imposition. Regarded as less important but necessary were layout, makeup and markup, materials and tools, proofreading, lockup, and darkroom and camera work.

The journeymen suggested that a number of work processes be added to on-the-job training. However, these processes are very likely already part of many apprentices' training; coldtype composition was of interest to many journeymen, primarily because of its flexibility for use in advertisements. Many journeymen felt that English and proofreading should be emphasized on the job. A number of them perceived a lack in the areas of linotype operations, makeup, and keyboard. "New processes" were mentioned by most of those commenting.

Table 1. JOURNEYMEN RATINGS OF THEIR APPRENTICESHIP

ASPECT OF TRAINING	JOURNEYMEN ¹		
	Percent who rated aspect excellent	Percent who rated aspect good	Percent who rated aspect very poor
On-the-Job Training			
Quality of training	27	38	0
Willingness of others to teach me	29	32	1
Conditions of facilities and equipment	13	37	0
Match of scheduled and actual times	12	22	4
Means for checking trade progress	12	23	4
Related Instruction			
Quality of instruction	16	34	0
Quality of training aids (books and charts)	19	27	0
Quality of tests on trade theory	14	26	1
Match of actual and scheduled times	7	27	1
Relationship of subject matter areas to actual trade content	17	25	3
Keeping subject matter up to date	16	21	3
All Training			
Administration and supervision	16	33	1
Opportunities for trade talks (with boss, instructor, JAC, etc.)	14	25	5
Overall rating of training	14	42	1

¹Number of those queried equaled 113; some respondents did not record an opinion.

RELATED INSTRUCTION

Through classroom or correspondence study conducted away from the work atmosphere of on-the-job training, an apprentice is expected to learn the trade theory that will form the groundwork for the job skills he is expected to acquire. Such instruction might encompass anything which would make a compositor a more valuable employee to his eventual employer. Coordination of the relevant trade subjects taught in related instruction with the processes being learned on the job should have high priority; however, apprentices reported this to be one of the major areas that need improvement in their programs.

Apprentice Experience

Only one-fourth of the apprentices said that the scope of related instruction matched or exceeded the breadth of training offered on the job. Another one-fourth reported that a considerable amount of trade theory was not presented in related instruction, and 15 percent of the apprentices reported no "off-the-job" instruction at all. (Perhaps some of this latter group were receiving no instruction; however, it is possible that these apprentices attended classes during working hours and they did not understand the survey question.)

An apprentice printer needs to be made aware of new methods and equipment in his related instruction. If at all possible, he should be given training in the most modern techniques employed by the

industry. Teaching equipment and materials should be up to date. Classes should be small enough to allow individual attention within the framework of a training program large enough to offer substantial resources. In other words, large programs are desirable, but large classes are not. Apprentices report that related instruction is chiefly valuable for the opportunity it affords to ask questions and have them answered at length.

Apprentices wanted to receive training in new processes and operation of equipment, and they also asked that their instructors be competent in the trade and qualified to teach. A variety of teaching methods and techniques was viewed as desirable by the trainees. They suggested that program administration and coordination be improved to foster a spirit of understanding and cooperation among those involved in training. They wanted high standards to be maintained, but also desired that personal needs and problems be given sympathetic attention.

Classes tended to be held throughout the year. For a majority of apprentices, classes were held during regular working hours; very often, the regular hourly rate was paid the trainees during classroom hours. Generally, public facilities were also in use. The union, alone or in cooperation with management or the public schools, generally provided the instruction. (As mentioned previously, most of the apprentices surveyed were in joint union-management programs.)

More than half of the apprentices were in programs in which each subject was taught by a different instructor or team. However, some programs had only a single instructor. Also, some apprentices took correspondence courses. Guest speakers were rare; only 1 apprentice in 10 had the opportunity to learn from a visiting expert as frequently as once a year. JAC visits were more common in the classroom; 1 apprentice compositor in 4 reported such visits during his first year of apprenticeship.

Class sizes were mainly small—usually six to 10 apprentices—but some classes had more than 20 trainees. Journeymen sometimes took a course offered to apprentices, but their presence was not common. Apprentices tended to think that classroom communications were good and that goals and standards set forth at the outset were maintained. Tests were usually constructed by the teacher; however, some teachers used standardized tests for some courses. The tests were generally the short-answer, objective kind. More than

half of the apprentices indicated that they were also given skill performance tests in related instruction courses.

Nearly three-fourths of all apprentices reported that in at least 1 training session in 5, actual up-to-date trade equipment and materials were used. In nearly every session, a variety of teaching methods was used. Programed instruction, supervised study, lectures, and discussions were supported by demonstrations for the majority of apprentice compositors. Use of instructional aids varied considerably, but these aids were appreciated when used. In union programs, texts and worksheets were available through national sources and generally were used. A considerable number of apprentices used films, pictures, slides, charts, graphs, and posters. Most apprentices who used them deemed them helpful; perhaps their use should be more common.

Apprentices showed a high preference for having a different instructor for each subject. They also preferred to have only their own trade taught in a class. They preferred having trade theory taught before or concurrently with the necessity to apply it on the job. Opinion varied considerably as to whether individual or group study was preferable; the largest group leaned in favor of a combination. Correspondence was the least favored method of study.

The most serious drawback to related instruction, apprentices felt, was that too little time was spent on new materials and equipment. Other liabilities cited were lack of good texts and visual aids, financial hardships and inconveniences worked on apprentices, and a preponderance of "useless academics."

However, strengths were seen also: the opportunity to receive good schooling related to practical job demands, the opening up of new job possibilities, and the chance to ask questions about the trade.

Course Content

Curriculum is a major concern for those who plan related instruction programs. In view of limited resources, where should the emphasis be? How much reliance should be placed on experience? How much on present analyses of the trade? How much on projections?

Required courses in related instruction for apprentices were:

<u>Subject</u>	<u>Percent of apprentices for whom subject is required</u>
Technology of trade	85
English	67
Mathematics	60
Drawings and/or prints	23
History of the labor movement	15
Industrial relations	5

Journeymen tended to consider the curriculum offered them when they were apprentices as too scant rather than too broad. The most commonly suggested additions were new processes and equipment (including photocomposition and basic electronics); more emphasis on makeup, layout, and design; and more instruction on linotype operation and maintenance.

Looking over the courses they took when they were apprentices, the journeymen identified English, layout and design, makeup and pasteup, and machine operations as being the most important. The following, they felt, were also important: composition, mathematics, advertisement design and makeup, and ITU lessons and correspondence courses. Proofreading, camera work, typing, imposition, and new processes were also deemed useful subjects.

ADMINISTRATION

The body responsible for administering the training program has a big task. There are problems of adequate facilities, equipment, and training materials. The difficulty of obtaining journeymen who are trained in teaching and technically up to date warrants special emphasis. Recordkeeping—although not as serious a problem as in some other trades—is essential to assure that apprentices are receiving the intended instruction and to assure proper credit for work completed. Sufficient and reliable testing of trade progress is a problem for the controlling body as well as the instructor.

When asked in what ways training could be improved, the apprentices most frequently mentioned the following areas: coordination, supervision, and guidance. Successful training programs generally have strong, active labor-management bodies, as well as a training coordinator or administrator. These officials are responsible for seeing that adequate records are maintained, that accurate measures of skill development are constructed, that sufficient contact is kept with the trainees on the job, that production schedules do not interfere with training, and that the trainee and his instructor are compatible.

Journeymen who had completed apprenticeship gave estimates of the training conditions which prevailed during their apprenticeships. (See table 2.)

The ITU's publication *Apprentice Regulations* supplies guidelines for local union training programs. (There are no national apprenticeship standards in the printing trades registered with any

TABLE 2. JOURNEYMEN'S ESTIMATES OF TRAINING CONDITIONS¹

Condition	Journeyman ¹		
	Percent who estimated condition as "far too much"	Percent who estimated condition as "about right"	Percent who estimated condition as "far too little"
Total time scheduled, on-the-job training	1	0	62
Total time scheduled, related instruction	0	5	44
Total time scheduled, entire apprenticeship	2	1	55
Number of job rotations	0	9	41
Number of OJT instructors	1	6	50
Number of trade theory tests taken	0	11	41
Number of performance tests taken	0	12	38
Amount of training material available	1	6	51
Amount of average weekly pay	0	14	34

¹ Some respondents did not record an opinion.

Governmental agency.) The ITU regulations go further than the registered standards of many trades. They prohibit keeping an apprentice on work in which he has gained competence when there remains work in which he could use training. In a significant departure from most apprenticeship standards, the ITU regulations advocate that the measure in apprenticeship advancement be trade competency—not the completion of rigid time requirements.

On the other hand, the regulations set certain principles which are prevalent in the majority of apprenticeship standards. The necessity for a strong and active JAC which selects apprentices, fixes their program, and determines their advancement is stressed. The JAC should be able to provide training that is flexible to the needs of the shop and of the individual. Although the regulations emphasize a strong JAC, they fail to mention a training director or coordinator such as is employed in most of the better training programs. Journeyman-apprentice ratios should be set in the collective bargaining agreement, ITU counsels.

Advisory Committee Recommendations

While the ITU's *Apprentice Regulations* do not mention the funding of training, the advisory committee to the researchers held that a willingness to assign adequate money to the effort is essential to a high-quality program. It stated that employers and labor must work together for the benefit of the apprentice in this as in other areas.

The committee also advised the researchers that quality programs must have a curriculum which couples on-the-job training with technical training given in the classroom or through correspondence courses. The quality of the instruction must be tested constantly—by the JAC, the foreman, and the apprentice.

When selected, the apprentice should be given adequate pay and otherwise treated as a first-class citizen. As a "citizen" he should be apprised of his rights and obligations as contained in his collective bargaining agreement, labor laws, union regulations, and the like. The committee stressed that the apprentice must not be kept merely on routine tasks, but rather that a competitive spirit must be fostered through demanding tasks to stimulate him to strive for excellence in his work.

Going further, the committee suggested that programs use local and international unions' schools and manufacturers' schools whenever possible. Should equipment needed for training not be present in the shop in which an apprentice is employed, the apprentice must be given the training in another shop.

Also, the technology learned should be modern and mechanized up to the current state of the art. Procedures must be devised to incorporate new processes into the curriculum.

Craftsmen as Instructors

Good education implies good instruction. Printers regarded related instruction given by patient, helpful, and trade-competent instructors as preferable to related instruction conducted via the mailbox. An instructor is typically a journeyman who is teaching either full time or in addition to regular work. He is willing to repeat instructions, explanations, and demonstrations. His presentations are nearly always clear and very often interesting. He encourages and is receptive to questions—a quality highly valued by apprentices taking related instruction. Pride in craftsmanship is important to the instructor and is stressed in his classroom. Encouraging self-reliance on the part of the apprentices is emphasized to a lesser extent.

While nearly half of the journeymen who were sampled indicated that they had served as instructors on the job, only about 8 percent said they had taught a related instruction course. Training of some sort had been received by one-fourth of the journeymen to help them in their teaching. The general level of teaching experience among those journeymen who taught was 10 years.

Among both journeymen and apprentices, about one-third of the craftsmen indicated that they would serve as instructors with no conditions attached. Others indicated that they would require conditions such as adequate pay or instructor training.

The ITU has a system which is perhaps unrivaled for training journeymen in new techniques—the Training Center in Colorado Springs. In more than 10 years of operation, journeymen and apprentices have learned various technical processes at the Center. The training is undoubtedly valuable to instructors on the local level; about 100 local training centers staffed with Colorado Springs graduates have arisen. Teaching techniques are not taught at the

Center, however. Except for observation of the general excellent quality of instruction offered at the national facility, students have no opportunity to learn the mechanics of education.

Those who have reported being trained as instructors generally have received such training either through the employer or through the labor union. Seldom was college credit given for the course work, nor was it generally applied toward a teacher's license or instructor's certificate.

UPGRADING AND KEEPING PACE

A major concern of the apprenticeship study was to identify the mechanisms affecting the ability of workers to keep up with the changing needs of the industry. The ability to keep subject matter and training methods current is an essential ingredient in the optimum apprenticeship training program. For the journeyman, continuation training is necessary to combat skill obsolescence. For the manufacturer, it is vital that there exist an adequate pool of tradesmen with updated skills to handle the innovations flowing from ever developing technology.

Methods of Keeping Current

Although four-fifths of the printers recognize skill obsolescence as a problem, only 1 printer in 8 is required to participate in training as a condition of employment; fewer than half had participated in some type of organized training in the past 2 years, and 70 percent indicated either that no formal training records were being kept or that they did not know about them. Further, two-thirds said they had not read, studied, or referred to at least one piece of trade literature or reference material on their own time in the last 30 days.

How then do journeymen keep up with their trade? What avenues are open to them to broaden their skills? What methods do they presently use to keep themselves informed on what the new skill areas are?

The following table lists the responses of journeymen and apprentices to the question: "What method or methods do you use to keep up with the trade?"

<u>Method</u>	<u>Percent of journeymen who use method</u>	<u>Percent of apprentices who use method</u>
Trade journals	70	55
Talks with fellow tradesmen . . .	65	70
Special union reports	64	47
Talks with union representatives .	47	1
Talks with foremen and supervisors	28	1
Talks with trade instructors . . .	22	1
Off-the-job instruction	²	23
Talks with OJT instructor	²	18
Manufacturing service bulletins .	17	15
Attendance at training schools . .	11	14
Talks with manufacturing representatives	10	7
Other	5	3

¹ Method was not listed on apprentices' questionnaire.

² Method was not listed on journeymen's questionnaire.

Continuation Training

While participation in continuation training programs seems to be greater in the printing field than in the machine and tool and die trades and roughly equal to that in the pipe trades, it falls short of the numbers of those who view trade obsolescence as a problem and those who want more trade training.

Half of the printers stated that they definitely wanted more training. Only 1 in 10 indicated he did not want more training, while about 1 in 4 said that he would participate in training in order to keep his job or to get a promotion. Some were undecided. Whether a journeyman was receptive to more training appeared to be related to age, marital status, and educational level. Generally, the fewer years a tradesman had left before retirement, the less apt he was to desire more training. Married printers—particularly those with children—desired training more frequently than did the unmarried. The respondents felt that journeymen should at least have the same chance at training in new processes as the apprentice did.

When asked what kind of training they desired, the general nonspecific response was overwhelmingly that of training on new processes and equipment. Computer programing, camera and darkroom processes, coldtype processes, photocomposition, paste makeup, electronics, and automated typesetting were specifically mentioned, as were linofilm operation, teletype, offset, and color separation. Others wanted courses that would help them move ahead to supervisory and management jobs.

Journeyman were asked how much of their own money they were willing to spend on training. More than half were willing to pay more than \$1 for each hour. Nearly one-fourth would pay as much as \$3 for each hour if they felt the training was useful and what they needed. When the question was stated in annual terms, about 60 percent were willing to invest more than \$50 a year. One in 10 would invest nothing.

Most journeymen would attend training classes as often as once a week, and more than half stated their willingness to go 2 or 3 days a week on their own time. Nine out of 10 journeymen would travel at least 4 miles to get more training if they felt they needed it.

Generally, journeymen preferred that training be conducted at the jobsite and felt that a combination of individual and group instruction was best. They asked for training in manual skills and trade theory in equal proportions. In training classes, they asked that they be matched with journeymen in their own trade for maximum class efficiency. They wanted the assurance of being able to apply their training on the job. Other conditions which journeymen indicated must be met before they substantially involved themselves in training included pay for time spent in training, joint program sponsorship by an employer and a labor group, reimbursement for expenses, and credit toward a certificate or college credit.

Manufacturers' Stake

Manufacturers—themselves employers of printing tradesmen and involved in their own inplant training—were polled as to their views on the adequacy of current programs in preparing tradesmen to handle innovations and to assimilate technological change.

When the researchers asked manufacturers to forecast changes that would occur in the next 3 to 5 years, most of the responses related either to materials processing or to automated control of the

printing process, photography, ink/water balance, and exposure control. More efficient methods for cutting and trimming, collating, pagination, drilling, and ink drying were forecast. Technological advances were predicted in halography, camera-speed coating on photoengraving plates, use of dusting materials other than starch, increased use of optics and electronics in typesetting, more efficient paper conversion and handling, and development of more and better plastic materials for special printing.

How these advances might affect the job skills needed by journeymen compositors is uncertain. By a margin of 2 to 1, the manufacturers felt that present apprenticeship programs would not be adequate to the needs of the trade in 5 years' time. They suggested that in the future journeymen would be operating more complex equipment—equipment which they will have to trouble-shoot, control, and adjust. These might be such devices as optical scanners, high-speed printers, and computers. More specialized skills will be needed for some new operations, while more general skills will be sufficient for other advances.

Of the firms which had apprenticeship programs, however, most were satisfied with the pace their apprentices were keeping with respect to developing technology.

Manufacturers frequently cited the prejudices of individual printers as being the biggest bottleneck to change. The force of traditional ways of doing things—e.g., using hot metal processes as opposed to coldtype, and typesetting by computer as opposed to linotype operation—is strong, they said. However, resistance to change is not concentrated exclusively in the journeymen, manufacturers believe, but is also found to a lesser extent among foremen, mechanical superintendents, and plant owners who have an investment in present equipment. Resistance from labor unions exists at times, manufacturers indicated, but is probably applied selectively to secure for the members the advantages offered by new equipment.

For journeyman printers wishing to keep up with developments in the trade, a poll of manufacturers elicited four major suggestions:

1. Read available trade publications and literature.
2. Visit schools, commercial establishments, and trade shows.
3. Attend relevant adult education courses at college or university level.
4. Encourage visits from suppliers of new equipment for coaching and for presenting visual aids.

Some manufacturers stress that in the future a printer will need a much broader scientific background and that he will not be fully useful with "just a set of motor skills." Job concepts for operation and maintenance positions on computers and optics systems run far beyond what is generally taught in high school. A technician rather than a craftsman is needed.

The involvement of manufacturers with the production of training materials and the provision of installers is understandably greater when the machinery is complex or the product new, requiring special skills or a complicated changeover from old methods. To aid in the start up of complicated equipment, three-fourths of the manufacturers provide either training programs or servicemen. Many furnish training materials varying from descriptive literature to visual aids and mockups. One manufacturer in 4 went so far as to furnish instructors to apprentice programs.

In introducing new technology, manufacturers stress that acceptance by "key" customers is essential. Institutions which might aid in assimilating new products are the American Newspaper Publishers Association Research Institute, the Graphical Arts Technical Foundation, and the ITU and its Colorado Springs facility. Acceptance is solicited through trade publications, direct mailings of work samples produced by using the new methods, and factory instruction offered to users.

KEYS TO EFFECTIVE TRAINING

In almost all respects, outstanding apprenticeship programs in printing were very similar in their general characteristics to those reported in the other trades studied. Common elements included:

- A belief on the part of those employers, trainees, and unions involved of the viability of apprenticeship as a source of skilled workers.
- A definite budget for training.
- Employment of a full-time training staff.
- Written apprenticeship agreements or indentures.
- A systematic recordkeeping procedure.
- Periodic testing of trainees.
- Use of several qualified instructors.
- A complementary training program for journeymen.
- Fairly large enrollments in all training programs.
- Good physical facilities both for related instruction and for development of selected manual skills.
- Good instructional materials, including textbooks and other learning aids.
- Reasonable trainee-instructor ratios.
- Tight control on absenteeism.

Active JAC's marked the more successful programs, while dormant JAC's were common to the programs with problems. Functions of the JAC may vary somewhat. For example, book and job publishers are more apt to have apprentices recommended to them by the JAC than are newspaper publishers. However, close

involvement between the JAC's and the apprenticeship programs seems desirable.

The methods used to finance the costs of the training programs varied among the better programs and did not seem to be an indication of program success or failure. The important point was that the financing was adequate to carry out established goals. Employers generally bore some part of the costs of apprenticeship; journeymen or apprentices often picked up another portion. Financing can be a problem in introducing new technology; who pays what can be a sticky point.

The research team concluded that while the elements that make up a good system of training are known, the weaknesses in the system stem from the failure to administer, coordinate, and control—that is, to put into practice—well recognized principles. On the basis of responses from apprentices, journeymen, employers, union officials, manufacturers, and others, it became apparent that certain distinct qualities characterized “outstanding” trade training programs. To repeat, these programs can be defined as those producing the “ideal journeyman”—one who possesses the overall skill to handle any job in the trade, however complicated; who has the initiative to move from one job to another with a minimum amount of supervision; who produces high-quality work; and who has the ingenuity to accomplish whatever task is assigned even though the tools, materials, or equipment available may not be ideal for the job.

WHERE TO GET MORE INFORMATION ABOUT MANPOWER PROGRAMS

The major purpose of the U.S. Department of Labor's Manpower Administration is to bring people and jobs together. For more information on manpower programs and services in your area, contact your Regional Manpower Administrator at the address listed below or the nearest office of your State employment service.

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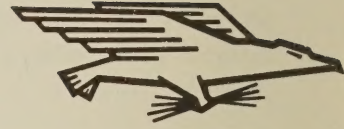
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